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09/532,025	03/21/2000	Daniel E Hinton SR.	00479.86844	7484

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EXAMINER

DADA, BEEMNET W

ART UNIT	PAPER NUMBER
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2135

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/532,025

Applicant(s)

HINTON ET AL.

Examiner

Beemnet W Dada

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13,15,19,20 and 22 is/are allowed.
- 6) ☒ Claim(s) 1-12 and 21 is/are rejected.
- 7) ☐ Claim(s) 16-18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2-4.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

1. Claims 1-13, 15-20 and 22 have been amended and claim 14 has been cancelled on an amendment filed on June 3, 2004. Claims 1-13 and 15-22 are pending.

Claim Objections

2. Claims 16-18 are objected to because of the following informalities: Claims 16-18 depend from a cancelled claim 14. Appropriate correction is required.

Allowable Subject Matter

3. Claims 13, 15, 19, 20 and 22 are allowed.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corron et al, US Patent 5,857,165 in view of Chua et al. (Transmission of Digital Signals By Chaotic Synchronization) (Ref U).

6. As per claim 1, Corron et al discloses a communications device (abstract, col 3 In 37-47), comprising: a transmitting chaotic circuit with at least one circuit element (fig 2) the value of which affects a chaotic electrical property of said chaotic circuit (input voltages, fig 2); said at least one circuit element having multiple component elements (capacitors c1 and c2, fig 2), said chaotic property being applicable to a communications channel such that said chaotic property is detectable by a receiver signally connected to said communications channel (fig , col 3 In 38-65), whereby said property forms a chaotic carrier signal (col 3 In 3865), whereby said chaotic carrier signal is modulated by said information signal (abstract, col 3 In 38-44). Corron et al further discloses modulation switching between two chaotic states through input modulation values V_R and V_L into R_1 and R_2 (col 7 In 14-27), wherein the modulation rates are defined by equation (29). The rates may either be discrete or continuous (see figure 4 plot 208). Switching in the case of the discrete two-value case is occurring between the two states to the chaotic system. However, Corron et al does not explicitly teach a component element being isolated from said chaotic circuit by a switch such that when said switch is switched to a first state, said value has a first magnitude and when said switch is switched to a second state, said value has a second magnitude. However Chua et al teaches a transmission of digital signals by chaotic synchronization, a component element being isolated from said chaotic circuit by a switch such that when said switch is switched to a first state, said value has a first magnitude and when said switch is switched to a second state, said value has a second magnitude and further including the switch being controllable responsively to an information signal without transforming said information signal (See, Page 402). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the system of Chua et al

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within the system of Corron et al, in order to transmit chaotic signals without transforming the information signal.

7. As per claim 2, Corron et al discloses wherein said at least one circuit element is a capacitance (fig 2).

8. As per claim 3, Corron et al discloses a field effect transistor (FET) for modulation (fig 2, see also tables 2 and 3).

9. As per claim 4, the combination of Corron et al and Chua et al does not explicitly teach wherein said FET is an optoisolator. However, optoisolators are well known in the art to comprise of JFET coupled to an LED such that the JFET resistance goes down to 100 ohms and when the LED is off the resistance is unmeasurably high. Thus one of ordinary skill in the art would have recognized the advantage of using an optoisolator as an excellent series/shunt switch, which are also relatively cheap.

10. As per claim 5, Corron et al further discloses a controller programmed to decompose an information signal into successive actuations of said switch to encode said information signal by modulating said chaotic carrier (information signal is modulation on a carrier through parameter modulation of an oscillator, col 2 ln 20-37 and col 3 ln 38-48).

11. As per claim 6, Corron et al further discloses said transmitting chaotic circuit includes a Chua circuit (fig 2, col 6 ln 23-28).

12. As per claim 7, Corron et al discloses a communications device (abstract, col 3 ln 37-47), comprising: a transmitting chaotic circuit configurable responsively to an information signal (col 3 ln 38-46) such that said transmitting chaotic circuit produces at least three different chaotic signals (λ specifying a different state of the system. Corron further discloses both discrete and continuous variation of λ , and hence at least three chaotic signals, fig 4 plot 208 and equation 23), each being characterized by a different trajectory versus-time characteristic (time varying λ , col 3 ln 58-col 4 ln 23, equation 3, and col 7 ln 12-29), a receiver with an oscillating sub portion to which said at least three different chaotic signals can be applied to drive said oscillating sub portion (figs 3 and 4, col 2 ln 20-21). Corron et al discloses demodulation of one or more states (fig 4) using a filter (col 4 ln 56-60). Corron et al does this so as to make his system capable of utilizing both analog as well as digital signals. Corron et al does not explicitly teach transmitting chaotic circuit produces at least three different chaotic signals, each being characterized by different trajectory-versus-time characteristic while maintaining a same oscillating regime. However, Chua et al teaches a transmission of digital signals by chaotic synchronization, including transmitting chaotic circuit that produces at least three different chaotic signals, each being characterized by different trajectory-versus-time characteristic while maintaining a same oscillating regime [see pages, 396-397]. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include Chua's method of transmission of digital signal within Corron et al in order to provide a stable system.

13. As per claim 8, Corron et al does not explicitly teach a fast Fourier Transform (FFT) calculator. However, FFT is a standard means of using convolution to separate two signals (the carrier from the modulation), especially when modulating a digital signal. It would have been

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obvious to one of ordinary skill in the art at the time the invention was made to further modify the beat detector (as described in claim 7) to include a FFT calculator within the system of Corron et al because it would have performed signal enhancement in addition to demodulating a signal.

14. As per claim 9, Corron et al further discloses said oscillating sub portion includes a tank circuit (LC combination of fig 2).

15. As per claim 10, Corron et al further discloses, said transmitting chaotic circuit is configurable by selectively isolating and connecting circuit elements thereof to vary at least one of a capacitance, an inductance, and a resistance (fig 2, col 3 ln 38-65).

16. As per claim 11, Corron et al further discloses said chaotic circuit being a configurable Chua circuit (col 6 ln 24-27).

17. As per claim 12, Corron et al teach each of said at least three different chaotic signals corresponds to a separate configuration of said chaotic circuit (λ specifying a different state of the system. Corron further discloses both discrete and continuous variation of λ , and hence at least three chaotic signals, fig 4 plot 208 and equation 23); said Chua circuit includes a tank circuit with a capacitor with a capacitance C_2 and an inductor with inductance L , coupled to a non-linear resistance element through a resistor with resistance R (L_1 , C_2 , R_5 , fig 2); the values of said inductance, said capacitance, and said resistance, of all of said separate configurations are characterized by equal values of $\alpha = C_1/C_2$ and $\beta = R_2 C_2/L$ (equations 27, col 6 ln 65-col 7 ln1).

18. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Corron et al, US Patent 5,857,165.

19. As per claim 21, Corron et al teaches a communications system comprising: transmitting and receiving Chua circuits at least one component of said transmitting Chua circuit including at least two subcomponents, at least one of which being selectively isolated from said transmitting Chua circuit by a switch (isolates from the chua circuit via an op amp FET switch, fig 2) such that a current oscillating regime of said transmitting Chua circuit is selectively alternated between at least two respective oscillating regimes (if the signal is discrete, states of the oscillators will have at least two states, see fig 4, plot 208); said switch being switchable responsively to an information signal (VR and VL, fig 2), values of said at least two subcomponents together with a configuration of said switch being such that one of said at least two oscillating regimes is substantially the same as an oscillating regime of said receiving Chua circuit, whereby said receiving Chua circuit is synchronizable with said transmitting Chua circuit (col 2 In 20-22) when said current oscillating regime is said one of said at least two oscillating regimes (if the signal is discrete, states of the oscillators will have at least two states, see fig 4, plot 208); whereby said information signal may be recovered from said chaotic signal (figs 1 and 2, and col 2 In 20-22). Corron et al does not explicitly teach a detector connected to detect when said receiving Chua circuit is in synchrony with a chaotic signal generated by said transmitting Chua circuit. However, Corron et al discloses an alternative method of detecting when said receiving Chua circuit is in synchrony with a chaotic signal generated by said transmitting Chua circuit through a modulation parameter that does not appear in the synchronous subsystem (col 2 In 20-36 and col 9 In 53-61), which is effective for both analog and digital signals (col 2 In 38-47). Furthermore, Corron et al discusses, in reference to prior art,

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a detector for detecting when said receiving circuit is in synchrony with a chaotic signal (col 1 In 40-50) for digital signals. It would have been obvious at the time the invention was made for an ordinary skill in the art to have a design choice to modify the teachings of Corron et al to include such a detector for digital signals because the applicant has not stated any particular reason for such a detector, other than for the means of demodulation, and that the demodulation means disclosed by Corron et al is just as efficient.

Response to Arguments

20. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

21. Applicant's arguments with respect to claim 21 have been considered they are not persuasive.

With respect to claim 21, Applicant argues that Corron et al does not teach "values of said at least two subcomponents together with a configuration of said switch being such that one of said at least two oscillating regimes is substantially the same as an oscillating regime of said receiving Chua circuit, whereby said receiving Chua circuit is synchronizable with said transmitting Chua circuit when said current oscillating regime is said one of said at least two oscillating regimes." The examiner respectfully disagrees.

Corron et al teaches a current oscillating regime of said transmitting Chua circuit is selectively alternated between at least two respective oscillating regimes (if the signal is discrete, states of the oscillators will have at least two states, see fig 4, plot 208); said switch being switchable responsively to an information signal (VR and VL, fig 2), values of said at least

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two subcomponents together with a configuration of said switch being such that one of said at least two oscillating regimes is substantially the same as an oscillating regime of said receiving Chua circuit, whereby said receiving Chua circuit is synchronizable with said transmitting Chua circuit (col 2 ln 20-22) when said current oscillating regime is said one of said at least two oscillating regimes (if the signal is discrete, states of the oscillators will have at least two states, see fig 4, plot 208); whereby said information signal may be recovered from said chaotic signal (figs 1 and 2, and col 2 ln 20-22).

Conclusion

22. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Beemnet W Dada whose telephone number is (571) 272-3847. The examiner can normally be reached on Monday - Friday (9:00 am - 5:30 pm).

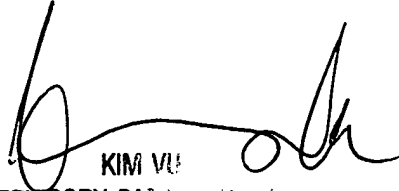
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Y Vu can be reached on (571) 272-3859. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Beemnet Dada

December 29, 2004



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